a second plate arranged on another side of the diagnostic system, said another side corresponding to another one of a left and a right side of an animal and extending in a direction of travel of the animal, said second plate being disposed adjacent the first plate;

a first plurality of load cells, each of the first plurality of load cells configured to detect a force applied to the first plate along at least one axis and output a signal representative of the detected force;

a second plurality of load cells, each of the second plurality of load cells configured to detect a force applied to the second plate along at least one axis and output a signal representative of the detected force; and

a processor adapted to execute at least one force analysis instruction set,

whereby the force analysis instruction set receives the signals output from the first and second plurality of load cells and calculates, in combination with the processor, a magnitude and location of a force applied to either of the first plate and the second plate.

9. (Amended) A computer-based diagnostic system to detect and analyze ground reaction forces produced by an animal passing through the diagnostic system in accord with claim 8, further comprising:

a railing disposed on each side of the step-up, adjacent an outside side of the first plate, adjacent an outermost side of the second plate, and on each side of the ramp down;

an upwardly projecting divider disposed between the first plate and the second plate.

25 31. (Amended) A computer-based diagnostic system to detect and analyze

ground reaction forces produced by an animal passing through the diagnostic system in

24

accord with claim 29, wherein the force analysis instruction set comprises instructions

which, when executed by the processor, compute a speed of the animal using a signal

output by a speed sensing device.

32 32. (Amended) A computer-based diagnostic system to detect and analyze

ground reaction forces produced by an animal passing through the diagnostic system in

31

accord with claim 30, wherein the force analysis instruction set comprises instructions

which, when executed by the processor, compute a speed of the animal using a signal

output by a speed sensing device.

56 58. (Amended) A computer-based method for detecting and analyzing ground

reaction forces produced by an animal, comprising the steps of:

guiding an animal to move across an instrumented force-sensing floor comprising

a left floor plate, a right floor plate, a plurality of left floor plate load cells configured to

measure a force applied to the left floor plate by movement of the animal's left limbs

across the left floor plate of the force-sensing floor and output a force proportioned

signal, and a plurality of right floor plate load cells configured to measure a force applied

to the right floor plate by movement of the animal's right limbs across the right floor plate

of the force-sensing floor and output a force proportioned signal;

constraining at least one of the animal's lateral body movement and leg movement

so that the animal's left limbs contact the left floor plate and the animal's right limbs

contact the right floor plate as the animal moves across the force-sensing floor;

34 (cont.) calculating forces applied to the left floor plate and to the right floor plate by

summing the signals output by the left floor plate load cells and right floor plate load

cells, respectively; and

comparing the calculated forces to a range of forces indicative of at least one of a

sound animal condition, an indeterminate animal condition, or a lame animal condition.

91. (Amended) A computer-readable medium bearing instructions enabling a

computer having at least one processor to detect and analyze ground reaction forces

produced by an animal to determine a physical condition of the animal, the instructions,

when executed by a computer, causing the computer to carry out the steps of:

35 calculating ground reaction forces produced by the animal as it moves across a

left floor plate and a right floor plate by summing the force proportioned signals output

by load cells separately measuring loads of each of the left floor plate and the right floor

plate caused by movement of the animal across the respective left floor plate and right

floor plate; and

comparing the calculated forces corresponding to movement of the animal across

the left floor plate and right floor plate to a range of forces indicative of at least one of a

sound animal condition, an indeterminate animal condition, or a lame animal condition.